YERUKHIMOVA, M. L.

*Rapid Determination of Boric Acid in Nickel-Plating Baths. R. S. Ashel'rod and M. L. Erukhimova (Zavodskaya Lab., 1934, 3, 121-123; C. Abs., 1935, 29, 79).—[In Russian.] Concentrate on a water-bath 10-25 c.c. of Ni bath liquor, add dropwise with stirring 40-60 c.c. 95° alcohol, cool, filter from inorganic salts, wash with alcohol, add to the filtrate an excess of 20% NaOH (up to 10 c.c.), evaporate to dryness, heat over a small flame to expel

NH_3 and decompose any organic matter (e.g. citric acid), dissolve the residue in water, filter, make acid to methyl orange with HCl, boil to expel any absorbed CO_2, dilute to about 100 c.c., neutralize to a pink tint with methyl orange, add 20 c.c. of previously neutralized glycerol or some mannitol with 0·1N-NaOH against phenolphthalein.—S. G.

ASB-SLA   METALLURGICAL LITERATURE CLASSIFICATION

YERUKHIMOVA, M. Ye.

19

Electrolytic Cleaning in Alkaline Solutions. R. S. Ashelrod and M. E. Eruhimova (*Tehnik Metallopromishlennosti* (*Messenger Metal Ind.*), 1936, 15, (16), 82-84).—[In Russian.] In the electrolytic degreasing of brass in an alkaline degreasing bath the work becomes covered with a silvery film of an alloy of copper 30-40, zinc 50-63, and iron 0-9% when the bath has been in use for some time. This effect is attributed to dissolution of the iron anodes and of pieces of brass which had fallen to the bottom of the bath. With more than 15 grm./litre of sodium hydroxide degreasing is accelerated, but becomes more rapidly contaminated and films appear on the work. Addition of 5 grm./litre of sodium phosphate tends to reduce the solubility of iron sediments while 10 grm./litre of sodium silicate improves the work of the bath in depth, 0·3 grm./litre of dextrin accelerates degreasing, and 0·7 grm./litre of sodium tartrate improves the degreasing of deeply recessed sections. The usual composition of the bath is sodium hydroxide 15, sodium carbonate 10, sodium phosphate 5, and dextrin 0·3 grm./litre.—D. N. S.

42157

S/203/62/002/001/005/019
I023/I223

3.1800

AUTHORS: Artem'yeva,G.M., Belikovich,V.V., Benediktov,Ye.A.,
            Yerukhimov,Z.M. and Korobkov,Yu.S.

TITLE: Measurements of cosmic radioemission absorption
            during the solar eclipse on February 15, 1961

PERIODICAL: Geomagnetizm i Aeronomiya, v.2, no.1, 1962, 58-60

TEXT: During the solar eclipse of February 15, 1961 observations
of the cosmic radioemission were made in Yevpatoriya at the
following frequencies: 25, 18.6 and 13 Mcs, and in Gor'kiy at
25 and 13 Mcs. Such measurements were omitted during previous
eclipses. The purpose of the present measurements is to discover
any decrease in the absorption of cosmic radioemission caused by
the solar eclipse and to differentiate between the absorption of
different layers. The apparatus used in both places was identical.
The receiving antennas consisted of six wave vibrators. The
maximum direction diagram was pointed to the zenith, and the width
at half power was 30°. The measurements were conducted for 10-12

Card 1/3

S/203/62/002/001/005/019
I023/I223

Measurements of cosmic radioemission...

days, before and after the eclipse. Data from the five days, on
which f_oF2 was not much different from its value on the eclipse
day, were used for further analysis. The variations of the
absorption during the eclipse are presented graphically. In
Gor'kiy at 25Mcs no effect was observed within experimental errors.
The maximum decrease of the absorption is shifted several minutes
with respect to the maximum of the eclipse. The lag is near to
the value of relaxation time in the D-layer. In Yevpatoriya a
second, smaller maximum, lagging by approximately 30 min, was
observed. This maximum is probably connected with changes in the
absorption in the F-layer, where the relaxation time is much
longer than in the D-layer. The ratio of the maximum changes of
the absorption in Gor'kiy and in Evpatoriya is approximately equal
to the ratio of the Solar zenith angles cosines. The main reason
for the changes in the absorption are changes in the electron
density in the D-layer. There are 2 figures and 1 table.

Card 2/3

S/203/62/002/001/005/019
I023/I223

Measurements of cosmic radioemission...

ASSOCIATION: Gor'kovskiy gosudarstvennyy universitet,
              Radiofizicheskiy Institut (Gor'kiy State
              University, Radiophysical Institute)

SUBMITTED: October 25, 1961

Card 3/3

L 35816-66 EWP(k)/EWT(m)/T/EWP(v)/EWP(t)/ETI IJP(c) JD/JD
UR/0125/66/000/005/0031/0034

ACC NR: AP6015245 (N) SOURCE CODE: 48

AUTHOR: German, S. I.; Yerukhimovich, A. A. 43

ORG: Khar'kov Turbine Plant im. S. M. Kirov (Khar'kovskiy turbinnyy zavod)

TITLE: Heat resistance of the welded joints of high-temperature pearlitic alloys

SOURCE: Avtomaticheskaya svarka, no. 5, 1966, 31-34

TOPIC TAGS: high temperature steel, pearlitic steel, heat resistance, weld evaluation, alloy composition/20KhM-L steel, 20KhMF-L steel, 15Kh1M1F-L steel, 15Kh2MF2FBS-L (P-3) steel, 15Kh14FKR-L (P-1) steel

ABSTRACT: On the basis of the newly introduced concept of the coefficient K_w of the heat resistance of welded joints, expressing the ratio between the stress-rupture strengths of the welded joint and the base metal and characterizing the degree of softening of the welded metal under conditions of prolonged operation at high temperatures, it is shown that the stress-rupture strength of pearlitic high-temperature steels designed for prolonged operation at temperatures of up to 600°C is a function of their chemical composition. These steels may be divided into three groups according to their K_w: 20KhM-L Cr-Mo steel ($K_w = 1.0$), for which the strength of the base metal and the weld metal is the same; 20KhMF-L, 15Kh1M1F-L and 15Kh2M2FBS-L (P-3) Cr-Mo-V-

UDC: 621.791.011:536.495:669.14.018.45

Card 1/3

L 35816-66

ACC NR: AP6015245   5

Nb steels (K_w = 0.8-0.9); and 15KhMFKR-L (P-1) Cr-Mo-V-Co-B steel ($K_w \approx 0.6$). The lower stress-rupture strength of the welded joints in the 2nd and 3rd groups may be explained as follows: their fracture in the near-weld zone is due to the decrease in plasticity owing to prolonged high-temperature loading; thus, the K_w of welded joints also depends on the long-time plasticity of welded joints, in addition to its dependence on chemical composition of the steel. It is shown that the stress-rupture strength of the welded joints of pearlitic high-temperature steels may be related to their hardenability, i.e. to the depth of penetration of martensitic or troosto-martensitic structure during the quenching of steel. The relative effect of the chemical composition (alloy elements) on hardenability of a steel may be evaluated according to the change in the stability of the supercooled austenite in the pearlitic and intermediate regions: the greatest effect on hardenability is exerted by B, followed by Cr, Mo and other alloy elements. Thus, K_w also depends on the hardenability of steels: it decreases with increasing hardenability, as illustrated by Fig. 1 and the following formula, where hardenability of 15Khl4FKR steel is expressed by its carbon equivalent (in %):

$$C_{equiv} = C + \frac{Mn}{6} + \frac{Cr}{3} + \frac{Ni}{4} + \frac{V}{5} + \frac{Mo}{4} \,.$$

Card   2/3

YERUKHIMOVICH, A. M.

USSR/Medicine - Tuberculosis, Epidemiology   Jul/Aug 47
    Medicine - Tuberculosis, Statistics

"Experiences of Field Work at Villages," G. S. Ginzburg, A. M. Erukhimovich,
Ukrainian Tuberculosis Institute(Director: Prof B. M. Khmel'nitskiy), Ukrainian
Roentgen Institute (Director: Ye. A. Bazlov), 1½ pp

"Problemy Tuberkuleza" No 4

An account of a field trip to the kolkhoz Krasnaya Agronomiya which is located close
to Krasnopavlovka Lozovskiy region of Kharkov Oblast. There has been a large patient
for this kolkhoz and in 1946 there was an expedition to this area to determine the
status of tuberculosis. The article is a compilation of the data which was collected.

PA 34T53

YERUKHIMOVICH, A. M.

29298. Rol' i znacheniye rentgenologicheskogo issledovaniya v diagnostike khronicheskogo appenditsita. Voprosy onkologii i rentgenologii, No 1-2, 1948, s. 252-63

SO: Izvestiya Ak. Nauk Latviyskoy SSR. No. 9, Sept., 1955

YERUKHIMOVICH, A.M.

Roentgenologic data on the ileo-cecal region in chronic appendicitis.
Ter. arkh. 23 no.1:71-79 Jan-Feb 51.   (CLML 20:8)

1. Candidate Medical Sciences. 2. Of the Ukrainian Roentgen-Radiolo-
gical and Oncological Institute.

YERUKHIMOVICH, A.M., kandidat meditsinskikh nauk.

Roentgenodiagnosis of cancer of the duodenal bulb. Vest.rent.i rad. no.
2:67-69 Mr-Ap '53.   (MLRA 6:6)
                     (Duodenum--Cancer) (Diagnosis, Radioscopic)

YERUKHIMOVICH, A.M., dotsent (Khar'kov, Pushkinskaya, 82)

Considerations on chronic appendicitis. Vest. khir. 74 no.5:53-57
Jl-Ag '54.
(MIRA 7:10)
(APPENDICITIS,
chronic)

USSR/General Problems of Pathology - Tumors. Tumors of Man.   U.

Abs Jour : Ref Zhur - Biol., No 21, 1958, 98275

Author   : Yerukhinovich, A. M.
Inst   : -
Title   : A Case of Giant Cell Tumor (Osteoclastoblastoma) of the
             Toe.

Orig Pub : Novyy khirurg. arkhiv, 1957, No 6, 73-74.

Abstract : In a 33-year-old patient who suffered from endarteritis
             obliterans, there were pains in the right finger of the
             left foot. The third phalanx of the toe was increased
             in size, hyperemic, tender under palpation. Roentgeno-
             gically, an absence of bone structure was noted in the
             diseased region. By pathohistological examination of the
             removed phalanx, a tumor was discovered which consisted
             of small cells of osteoclastic and osteoblastic type,
             characteristic for giant-cell tumors.

Card 1/1   *Clinic of Balneology - Khar'kov Oblast' Dept. Health*

YERUKHIMOVICH, A.M., kandidat meditsinskikh nauk

Interrelation between peptic ulcer and chronic appendicitis from a radiological viewpoint. Sov.med. 21 no.1:96-100 Ja '57. (MLRA 10:6)

1. Iz Khar'kovskoy oblastnoy bol'neologicheskoy lechebnitsy (dir. P.L.Shpak).
(PEPTIC ULCER, etiol. and pathogen.
appendicitis, x-ray diag.)
(APPENDICITIS, compl.
peptic ulcer, x-ray diag.)

YERUKHIMOVICH, A.M. (Khar'kov, Pushkinskaya ul., d. 82, kv. 6)

Dynamics of development and malignant degeneration of esophageal polypi. Vop. onk. 5 no.1:106-111 '59.   (MIRA 12:3)

1. Iz oblastnoy klinicheskoy lechebnitsy (dir. - kand. med. nauk P. L. Shpak) Khar'kovskogo oblzdravotdela.
          (POLYPI, case reports,
                esophagus, malignant degen. (Rus))
          (ESOPHAGUS, neoplasms,
                polyp, malignant degen. (Rus))

YERUKHIMOVICH, A.M., dotsent (Khar'kov).

Chronic appendicitis in children and x-ray diagnosis. Pediatriia
37 no.6:74-77 Je '59.   (MIRA 12:9)
              (APPENDICITIS, in inf. & child,
                      x-ray diag. (Rus))

YEROKHIMOVICH, I.M., dotsent.

Significance of x-raying following appendectomy. Vest. rent.
i rad. 38 no.4,42-52 JL-Ag '63.
(MIRA 17:6)

YERUKHIMOVICH, L.R.

Increasing the wear resistance of slush pump cylindrical bush-
ings. Azerb.neft.khoz. 37 no.6:41-45 Je '59.
(MIRA 13:4)

(Oil well pumps)

LITVINOV, V.M.; YERUKHIMOVICH, L.R.; NIKOLAYEV, K.I.

Bench for testing the parts of drilling pumps. Mash. i neft. obor.
no.8:21-23 '64.   (MIRA 17:11)

1. Groznenskiy neftyanoy nauchno-issledovatel'skiy institut.

PODGORNEVA, A.I.; YERUKHIMOVICH, M.B., inzh.; NOVOZHILOVA, L.I., inzh.

Experience of a factory laboratory. Tekst.prom. 23 no.1:74
Ja '63.
                                                    (MIRA 16:2)

1. Nachal'nik nauchno-issledovatel'skoy laboratorii Vitebskoy
chulochno-trikotazhnoy fabriki imeni Kommunisticheskogo
internatsionala molodezhi (for Podgorneva). 2. Nauchno-
issledovatel'skaya laboratoriya Vitebskoy chulochno-
trikotazhnoy fabriki imeni Kommunisticheskogo internatsionala
molodezhi (for Yerukhimovich, Novozhilova).
            (Dyes and dyeing—Knit goods)
        (Ultrasonic waves—Industrial applications)

D'YACHENKO, Petr Yakovlevich; MIROTVORSKIY, Sergey Aleksandrovich;
YERUKHIMOVICH, P.L., nauchnyy red.; FRIDOKHOVA, T.N., red.izd-vo;
GLIZAHOVA, I.L., red.izd-va; TEMKINA, Ye.L., tekhn.red.

[Prefabrication of precast reinforced concrete] Zavodskoe izgo-
tovlenie sbornogo zhelezobetona. Moskva, Gos.izd-vo lit-ry po
stroit., arkhit. i stroit.materialam, 1960. 281 p.

(MIRA 13:12)

(Precast concrete)

YERUKHIMOVICH, P.L., kand.tekhn.nauk

Preliminary results of the study of the vibratory pressing of con-
crete. Trudy NIIZHB no.21:138-140 '61.   (MIRA 14:12)

1. Nauchno-issledovatel'skiy institut betona i zhelezobetona
Akademii stroitel'stva i arkhitektury SSSR.
                    (Vibrated concrete)

YERUKHIMOVICH, S. Z.

112-6-11861

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1957, Nr6, p.12 (USSR)

AUTHOR: Yerukhimovich, S.Z.

TITLE: Automatic High-Voltage Testing Outfit
              (Avtomaticheskaya vysokovol'tnaya ispytatel'naya ustanovka)

PERIODICAL: Informatsionno-tekhnicheskiy sbornik, Ministerstvo elektrotekhnicheskoy
              promyshlennosti SSSR, 1956, Nr10, pp.37-42

ABSTRACT: Factory testing of most flexible cords, wires, and cables include keeping
              them, or their semiproducts, under a certain voltage for a specified time
              period, then changing the voltage and keeping them up to the insulation
              breakdown. Most testing laboratories at cable plants use conventional h-v
              outfits for these tests with voltage changes and timing performed by a
              special worker. Deviations from the specified programs are not excluded
              with this system. In this connection, automation of tests seems interesting.
              Circuit diagrams are given, and an automatic h-v cable testing outfit is
              described.

ASSOCIATION: Cable Industry Research Institute
              (Nauchno-issledovatel'skiy institut kabel'noy promyshlennosti)

Card 1/1

YERUKHIMOVICH, P.L., kand. tekhn.nauk; MADATYAN, S.A., inzh.;
KLIMOVA, G.D., red.; SHEVCHENKO, T.N., tekhn. red.

[Instructions on the techniques of prestressing rod, wire,
and strand reinforcement of reinforced-concrete elements by
electrothermal and electro-mechanical methods]Instruktsiia
po tekhnologii ,redvaritel'nogo napriazheniia sterzhnevoi,
provolochnoi i priadevoi armatury zhelezobetonnykh kon-
struktsii elektrotermicheskim i elektromekhanicheskim spo-
sobami. Moskva, Gosstroiizdat, 1962. 115 p. (MIRA 15:8)

1. Akademiya stroitel'stva i arkhitektury SSSR. Institut be-
tona i zhelezobetona, Perovo.
          (Concrete reinforcement)

S/196/62/000/002/007/023
E194/E155

AUTHOR: Yerukhimovich, S.Z.

TITLE: Substitutes for copper and lead in the cable industry

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika,
              no.2, 1962, 12, abstract 2B 61. (Vestn.
              elektroprom-sti, no.8, 1961, 5-7).

TEXT: During the period 1959-1965 the Soviet cable industry
is required to save 400 000 tons of copper and 400 000 tons of
lead. Aluminium-core power cables of all sizes and voltages are
now manufactured. In 1965, 90% of all cables should have
aluminium cores and up to half of the output should have
aluminium sheaths. Cables with aluminium cores and polyvinyl-
chloride (PVC) sheaths should comprise 40% of the output. For
cables of 1 - 35 kV insulated with PVC and polyethylene it is
possible and desirable to replace their lead sheathing by PVC.
Plastic-insulated and PVC-sheathed cables have been developed for
voltages of 0.5, 1, 6, 10 and 35 kV. It is planned to make all
control cables with non-metallic and mainly plastic sheathing, and
more than 60% of them will have aluminium cores. In 1965 it is

Card 1/3

Substitutes for copper and lead ...

S/196/62/000/002/007/023
E194/E155

planned to replace copper cores by aluminium in 52.5% of power cables and only 5% of them will have lead sheathing. All signalling and interlocking cables will be made with plastic sheathing. Electric wires for lighting and general installations in buildings will have aluminium conductors, mainly insulated with rubber, PVC and 'nairit'. Work is proceeding towards the introduction of flexible aluminium-cored conductors for electrified transport and also similar conductors and cables for electric welding. Because of their lightness, conductors with aluminium cores are also important for shipbuilding and aviation. Copper may be saved by using non-metallic cores instead of copper for high-voltage ignition wiring in all kinds of automobiles. This wiring with non-metallic cores has been developed and is in series production. A study is being made of the possibility of replacing copper screening in a number of conductors and cables by various kinds of non-metallic screening materials. The cable works are manufacturing aluminium conductors insulated with enamel of vinyflex and 'metalvyn'

Card 2/3

Substitutes for copper and lead ...   S/196/62/000/002/007/023
E194/E155

(conductors grades ПЭВА-1 (PEVA-1) and ПЭВА-2 (PEVA-2)) and with polyamideresol enamel (ПЭЛРА-1 (PELRA-1) and ПЭЛРА-2 (PELRA-2)), and also aluminium conductors with copper insulation type АПБД (APBD), telephone or cable paper types АПБ (APB) and ПАБСД (PABSD), and glass-fibre insulated type АПСД (APSD). The electrical properties of these conductors are not inferior to the corresponding copper grades and they have better heat-resistance. Oxide-insulated aluminium conductors have been developed (grade ПАО (PAO)) for operation at temperatures above 200 $^{\circ}$C (long-term operation at 300 $^{\circ}$C and 6 hours at 540 $^{\circ}$C). Prototypes and batches of transformers and electric motors have been made with aluminium windings instead of copper. The Vilnius Electric Welding Equipment works is regularly producing welding transformers with aluminium windings. Recommendations are made concerning the introduction of grades and dimensions of aluminium winding conductors.

[Abstractor's note: Complete translation.]

Card 3/3

YERUKHIMOVICH, Tamara.

Work enhances the man. Rab. i sial. 33 no.8:5 Ag '57. (MIRA 10:8)
(Vitebsk--Machinery industry)

STEBAKOV, Ye.S.; RUBTSOV, N.N., prof., doktor tekhn.nauk, laureat
Stalinskoy premii, red.; YERUKHIMOVICH, TS.M., red.; ZUDAKIN,
I.M., tekhn.red.

[Specialist in removable flask molding] Formovshchik po bes-
opochnoi formovke. Pod red. N.N.Rubtsova. Moskva, Gos.izd-vo
obor.promyshl., 1946.   83 p.   (MIRA 12:9)
(Foundrymen)

ABIANTS, Viktor Khristoforovich; MITROKHIN, V.T., kand. tekhn.
nauk; YERUKHIMOVICH, TS.M., red.

[Theory of gas turbines for jet engines] Teoriia gazo-
vykh turbin reaktivnykh dvigatelei. Izd.2., perer. i dop.
Moskva, Mashinostroenie, 1965. 310 p.   (MIRA 18:6)

NOVIKOV, M.P.; SIVAY, A.V.; TROSHEV, A.I.; YERUKHIMOVICH, TS.M., ZU-
DAKIN, I.M., tekhnicheskiy redaktor.

[Installation of airplane engines; tools] Montazh aviatsionnykh
dvigatelei; montazhnye prisposobleniia. Moskva, Oborongiz, glavnaia
redaktsiia aviatsionnoi lit-ry, 1947. 267 p.   (MIRA 8:2)
        (Airplanes--Engines)

MALOV, A.N., dotsent, kand.tekhn.nauk; YERUKHIMOVICH, TS.M., red.;
    ZUDAKIN, I.M., tekhn.red.

[Manufacturing cartridges for small arms] Proizvodstvo patronov
strelkovogo oruzhiia. Moskva, Gos.izd-vo obor.promyshl., 1947.
414 p.   (MIRA 14:1)

1. Moskovskoye vyscheye tekhnicheskoye uchilishche im. Baumana
(for Malov).
                    (Cartridges)

YERUKHIMOVICH, Yu.A.;PIMENOV, Yu.V. (Moskva)

Calculation of a specific integral containing Bessel's function.
Zhur. vych. mat. i mat. fiz. 4 no.3:596-599 My-Je '64.
(MIRA 17:6)

AUTHOR: Yerukhimovich, Yu. A.,   Member of the   SCV/108-13-10-11/13
             Society

TITLE: The **Effect**   of Asymmetry in Radiolocation Units   on
             Their Performance (Vliyaniye asimmetrii v radiopelengatore
             na yego rabotu)

PERIODICAL: Radiotekhnika, 1958, Vol 13, Nr 10, pp 64 - 75 (USSR)

ABSTRACT: This is an investigation of the set-irregularities
             and of the smearing of the minima in multi-tower
             radiolocation stations with spaced antennas, if amplitude
             and phase are asymmetrical. General rules governing
             these phenomena are presented and the diagrams are
             plotted specifying the variation of the quantities
             mentioned, if one pair of antennas is asymmetrical, and
             for the radiolocation station as a whole. The kinds of
             irregularities which are the subject of this paper
             are to a high degree decisive for the accurate
             operation of the radiolocation unit. Phase asymmetry
             is much more detrimental with respect to the occurrence
             of great location errors than is amplitude asymmetry.
Card 1/3   This is true in particular for the long-wave interval

The . **Effect** of Asymmetriy in Radiolocation Units   on BOV/108-13-16-11/15
Their Performance

of the frequency range in radiolocation units with a
great frequency overlap. The rules governing the modi-
fication of location errors with the modulus and the
rules governing the minima smearing of the radiation
pattern are different with the two types of asymmetry:
If a small location error corresponds to amplitude
asymmetry, the accompanying smearing is relatively large.
For phase asymmetry conditions are inverted. In this
paper a possibility is shown of compensating that part
of the set irregularity curve by introducing a corresponding
controllable artificial asymmetry into the circuit of
the radiolocation unit. In stationary radiolocation units
this method also permits to eliminate part of the local
irregularities. There are 6 figures and 5 references,
5 of which are Soviet.

SUBMITTED: June 14, 1957 (initially) and April 21, 1958 (after
revision)

Card 2/3.

The Influence of Asymmetry in Radiolocation Units Upon   SOV/168-13-16-11/13
Their Performance

ASSOCIATION: Vsesoyuznoye nauchno-tekhnicheskoye obshchestvo radiotekhniki
              i elektrosvyazi im. A.S. Popova (All-Union Scientific and
              Technical Society of Radio and Communications Engineering
              im. A.S. Popov)

Card 3/3

S/108/60/015/06/05/006
B007/B014

AUTHOR: Yerukhimovich, Yu. A., Member of the Society

TITLE: Some Problems Concerning the Radio Bearing of Interfering
            Radio Waves

PERIODICAL: Radiotekhnika, 1960, Vol. 15, No. 6, pp. 62-66

TEXT: Contrary to Ref. 1, the author of the present article did not
utilize the concept of a beam of rays for the incoming wave, but studied
the radio bearing of interfering radio waves directly with special
regard to the specific features of the radio bearing of two interfering
beams. Here, automatic two-channel direction finders of the amplitude type
with direct reading or crossed-coil antennas. These may be multiple-
tower systems with spaced or crossed-coil antennas. It is assumed that
the direction finder does not react to the horizontally polarized type
component of the wave field. First, the author studies initial relations,
for which purpose he treats the case in which two coherent radio waves
with different parameters are received by the direction finder. He examines
utilizes results published by him in a preceding paper. Next, he examines

Card 1/3

S/108/60/015/06/05/006
B007/B014

AUTHOR: Yerukhimovich, Yu. A., Member of the Society

TITLE: Some Problems Concerning the Radio Bearing of Interfering
             Radio Waves

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the radio bearing of interfering radio waves directly with special
regard to the specific features of the radio bearing of two interfering
beams. Here, automatic two-channel direction finders of the amplitude type
with direct reading on the screen are examined. These may be multiple-
tower systems with spaced or crossed-coil antennas. It is assumed that
the direction finder does not react to the horizontally polarized
component of the wave field. First, the author studies initial relations,
for which purpose he treats the case in which two coherent radio waves
with different parameters are received by the direction finder. He
utilizes results published by him in a preceding paper. Next, he examines

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Some Problems Concerning the Radio Bearing   S/108/60/015/06/05/006
of Interfering Radio Waves   B007/B014

the rules governing the radio bearing of beams with constant or slowly
varying parameters. Figs. 1 and 2 show a typical picture of the specific
features of radio bearing for $\Delta_2 = 10^0$ (difference of the deviation of
the angles of incidence of the two beams from the arc of the major circle
drawn between the points of emission and reception). An analysis of the
formulas and figures of this article shows that considerable errors are
observed both with maximum ellipticity and with a minimum of the major
axis of the ellipse. Next, the author investigates the radio bearing of
two stations with almost equal frequencies. On the radio bearing of such
transmitters operating at the same time, an image in the form of a
parallelogram appears on the screen of the tube of the two-channel
direction finder. A theoretical explanation of this phenomenon is given,
and an exact mathematical solution of this problem is offered in the
appendix. It is shown that the difference between the frequencies of two
stations, which cause this "parallelogram", follow the condition (5).
On the other hand, inequality (6) must be satisfied in order that no
"parallelogram" occurs. Otherwise the signals of two stations are received

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Some Problems Concerning the Radio Bearing
of Interfering Radio Waves

S/109/60/015/06/05/006
B007/B014

as two beams from one source. Summing up: 1) Interference of two beams
leads to the reception of the signals of two stations as two beams from
one source, to a "parallelogram", and to "measuring of angles in sets"
(krugovoy priyem). 2) The main factor of the occurrence of interference
errors are the lateral deviations of radio waves from the arc of the
major circle. 3) The nature of the errors under consideration is such
that they cannot be completely eliminated in any case. The number of
erroneous readings and heavy errors in radio bearing can be reduced by
an exact analysis of the nature of the radio-bearing image. 4) On the
strength of the data obtained it is assumed that, in accordance with
Ref. 2, the heavy errors in radio bearing within the "dead" zone of the
transmitter and in the neighborhood are mainly due to lateral deviations
of radio waves. There are 4 figures and 3 references: 2 Soviet and
1 German.

$\checkmark B$

SUBMITTED: November 3, 1958

Card 3/3

YERUKHIMOVICH, Yu. A.

YERUKHIMOVICH, Yu. A., Cand Tech Sci -- "Accuracy of determination of the angle of advent of radio waves in systems equipped with spaced antennas." Mos, 1961. (Min of Comm USSR. Mos Electrical Eng Inst of Communications) (KL, 8-61, 243)

- 228 -

S/106/61/000/004/003/004
A055/A133

9,1300

AUTHOR: Yerukhimovich, Yu. A.

TITLE: Calculation of non-linear distortions in waveguide transmission
            lines

PERIODICAL: Elektrosvyaz', no. 9, 1961, 19-27

TEXT: This article is a further development of Lewin's works and, in
particular, of Lewin's article (Ref. 1: "The Multiple Reflections in the Long
Feeders", Wireless Eng., 1952, v. 29, No. 346). Lewin gave, indeed, an ap-
proximate solution of the problem of long feeders in the case of a large num-
ber of discontinuities M. In the present article, the author gives a precise
solution of the same problem for any value of number M, within the limits of
applicability of the used method. The works of Lewin are taken to be known,
and various expressions, formulae and designations used by him are currently
resorted to in the present article. Like Lewin, the author assumes that there
are, in the waveguide (feeder), M equidistant discontinuities, their reflec-
tion factor being the same. The article consists of two parts or chapters:
1) - Calculation of harmonic interferences in waveguide lines for any number

Card 1/3

Calculation of non-linear distortions...

S/106/61/000/004/003/004
A055/A133

/B

of discontinuities: Taking as starting point Lewin's formula for the inter-ference-power P_q corresponding to the q-th harmonic of the frequency ω_a, the author finds that the sums included in this formula can be calculated with precision for any value of M. After a comprehensive mathematical analysis, he derives, therefore, a new and more developed formula for P_q. 2) - Noises due to non-linear transitions: After another comprehensive mathematical calculation, the author derives a general formula giving the level of the relative power (G_1^2) of non-linear-transition noises for the maximum frequency of the multichannel signal. As a numerical example, he uses this formula for the calculation of the level of non-linear-transition noises in the case of a waveguide transmission line in a typical radio-relay system. In conclusion, the author states that the results obtained by him allow to widen the possibilities offered by Lewin's method and to analyse sectionalized transmission lines containing any number of sections. He also states that the existing recommendations concerning the calculation of noises due to non-linear transitions necessitate corrections (Marko - Ref. 4: Die Berechnung der Klirrfaktoren und des Klirrgeraeusches fuer die verschiedenen Verzerrungsarten bei Vielkanal-Richtfunksystemen mit Frequenzmodulation. "NTZ", Sept. 1957, B. 10,

Card 2/3

Calculation of non-linear distortions...

S/106/61/000/004/003/004
A055/A133

No. 9). There are 6 figures and 5 references, 3 Soviet-bloc and 2 non-Soviet-bloc. The English-language reference is: Lewin. The multiple reflections in the long feeders. "Wireless Eng.", 1952, v. 29, no. 346.

SUBMITTED: September 27, 1960

J_B

Card 3/3

YERUKHIMOVICH, Yu.A.

Consideration of nonlinear distortions in wave guide transmission
lines. Elektrosviaz' 15 no.4:19-27 Ap '61.   (MIRA 14:5)
(Wave guides)

_____, R. A., and ___ ___

...he diffraction of a plane e........
....eally-............ ....

............:   ...adiotekhnika i elektronika, v. ..
                   594-...,

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       ....ly and compared with accurate values deriv.......

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The diffraction of...   S/109/63/008/...
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YERUKHIMOVICH, Yu.A.

Propagation of plane electromagnetic waves above the earth
in the presence of horizontal reradiating lines. Radiotekhnika
18 no.2:15-26 F '63.   (MIRA 16:4)

1. Deystvitel'nyy chlen Nauchno-tekhnicheskogo obshchestva
radiotekhniki i elektrosvyazi imeni Popova.
                (Electromagnetic waves)
                (Antennas(Electronics))
                (Radio—Antennas)

YERUKHIMOVICH, Yu.A.

Solution of a problem of the diffraction of a plane electromagnetic
wave in a sphere with large diameter using an approximation method.
Radiotekh. i elektr. n. 10 no.1:21-30   Ja '65.

(MIRA 18:2)

YERUKHIMOVICH, Yu.A.

Frequency correlation in radio communication using dispersive
media. Radiotekhnika 20 no.9:27-35 '8.:65. (MIRA 18:9)

1. Deystvitel'nyy chlen Nauchno-tekhnicheskogo obshchestva
radiotekhniki i elektrosvyazi imeni A.S. Popova.

YERUKHMANOV, M·L·

GLINKIN, N. M.;   YERUKHMANOV, M.L.; ETKIN, G.S.

Spravochnik Mastera Metalloobratyvayushchogo Tsekha, published by
Rosgismestprom, Moscow, 1950

Book Sum #148

VYROV, A., inzh.; YERUNOV, I., inzh.

    Our building organizations must improve their work. Sel'.stroi.
18 no.11:7-8 N '63.   (MIRA 17:3)

    1. Upravleniye sel'skogo stroitel'stva Glavsrednevolzhskstroya.

5(1, 2, 3)

AUTHORS: Gvozdov, S. P., (Deceased), Yerunova, A. N.   SOV/153-58-5-26/26

TITLE: Chemical Temperature Indicators (Khimicheskiye indikatory
                temperatury)

ABSTRACT: A simple and rapid measuring of the temperature of the surface
                of a heated body is of special interest in industry where the
                overheating of one or the other machine or its parts must not
                occur. As is known, for this purpose so-called heat-varying
                colors can be used. Although such a temperature measuring
                serves for orientation it can be used in industrial practice and
                it is accurate enough if the variation of the color may be
                clearly noticed and the temperature of the variation had earlier
                been accurately determined. In cases where other methods can-
                not be used the chemical temperature indicators may become ir-
                replaceable. The task of the present paper was 1) to synthesi
                compounds the variation in color of which with temperature is
                very marked; 2) to determine the temperature of their variation
Card 1/3   of color; 3) to devise a method of applying these compounds as

Chemical Temperature Indicators

SOV/153-58-5-26/28

temperature indicators from 50 to 500° in industry. Two apparatus for the determination of the variation in color were designed: a) for an informative, and b) for an accurate determination (Fig p 155). The scale of the apparatus b was checked by means of compounds the temperature dependent variation of color of which may be found in literature. The results of these determinations are given in table 1. The authors decided to regard that temperature as the temperature of the variation in color at which the variation of color takes place abruptly, i. e. within 1-2 seconds. By means of paraffin a color pencil was produced from a corresponding color (additions of animal or synthetic fat, wax or ceresin as well as of fillers are recommended). With this pencil a line was drawn, or a point, on the surface of the test apparatus. The surface temperature was fixed by means of a millivoltmeter; the period during which the variation in color took place was measured by means of a stop-watch. Table 2 shows the variation in color of some compounds. From table 2 the dependence of the duration of the decomposition of some salts upon the temperature at which a

Card 2/3

variation of color occurs may be clearly seen. Based on this

SOV/153-58-5-26/28

Chemical Temperature Indicators

also the errors may be classified which usually occur in the temperature determination of the heated surface by means of heat-varying colors. The temperatures of the color variation of many compounds were determined (Table 3) by the method mentioned. In this way a set of color pencils for temperatures of from 35 to 450° was arranged. As the fat additions, as well as the fillers, somehow displace the temperature of the color variation of the pencils, this temperature is to be determined by this method in each single case. On the paper cover of the pencil there are to be indicated the temperature as well as the type of color variation. There are 1 figure, 3 tables, and 4 Soviet references.

ASSOCIATION: Leningradskiy politekhnicheskiy institut imeni M. I. Kalinina, Kafedra obshchey khimii (Leningrad Polytechnical Institute imeni M. I. Kalinin, Chair of General Chemistry)

SUBMITTED: December 16, 1957

Card 3/3

YERUSHLIMCHIK,

VINOGRADOVA, M.Ye.; YERUSALIMCHIK, glavnyy vrach.

Certain characteristics of the course of chicken-pox under the administration of ultraviolet rays. Vop.pediat. 21 no.3:38-41 My-Je '53.

(MLRA 6:7)

1. Infektsionnaya bol'nitsa imeni S.P.Botkina.
   (Chicken-pox) (Ultraviolet rays--Therapeutic use)

GRIBOV, Ye.I.; YERUSALIMCHIK, A.M., inzhener, nauchnyy redaktor; SHPAYER,
A.L., redaktor; LYUDKOVSKAYA, N.I., tekhnicheskiy redaktor

[Roofing paper] Krovel'nyi karton, Moskva, Gos. izd-vo lit-ry po
stroit. materialam, 1956. 207 p.   (MLRA 9:10)
          (Roofing)

GOLUBOVICH, Aleksandr Andreyevich, inzh.; YERUSALIMCHIK, Abram Meyerovich,
       inzh.; ZHARENOV, Andrey Sergeyevich, inzh.; ROZEN, O.B., kand. tekhn.
       nauk, nauchn. red.; SOKOL'SKIY, I.F., red. izd-va; OSENKO, L.M., tekhn.
       red.

       [The technology of bituminous roofing materials] Tekhnologiia bituminoz-
       nykh krovel'nykh materialov. Moskva, Gos. izd-vo lit-ry po stroit.,
       arkhit. i stroit. materialam, 1961.   373 p.   (MIRA 14:11)
                             (Roofing, Bituminous)

IL'INSKAYA, L.A.; TOLCHINSKAYA, G.Ya.; YERUSALIMCHIK, G.L.

Characteristics of antidiphtheria immunity in children in Leningrad.
Zhur.mikrobiol.epid.i immun. 33 no.5:6-10 My '62.   (MIRA 15:8)

1. Iz Leningradskogo instituta imeni Pastera, sanitarno-epidemiologi-
cheskoy stantsii Dzerzhinskogo rayona i Bol'nitsiy imeni Botkina.
                (LENINGRAD—DIPHTHERIA)

76-32-2-26/38

AUTHORS: Yefimov, Ye. A. , Yerusalimchik, I. G.

TITLE: An Investigation of the Kintics of the Anodic Dissolution of
             Germanium (Issledovaniye kinetiki anodnogo rastvoreniya ger-
             maniya)

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1958, Vol. 32, Nr 2, pp. 413-417
             (USSR)

ABSTRACT: According to the method of polarization curves and potential
             over time curves the kinetics in the anodic dissolution of
             germanium in dependence on its type of conductivity -elec-
             tron- and hole conductivity - was investigated. It is shown
             that with current densities of more than 3.10^{-3} A/cm^2 the
             process of anodic dissolution of n-germanium is greatly dif-
             ferent from that of p-germanium. It is assumed that the kine-
             tics of the anodic dissolution of germanium is limited by
             the diffusion velocity of the positive charge carriers- the
             holes from the depth of the semiconductor to its surface.
Card 1/2   It is shown that with current densities of 0,15 A/cm^2 the

76-32-2-26/38

An Investigation of the Kinetics of the Anodic Dissolution of Germanium

anode potential of p-germanium increased to 200 mV within
30 minutes, showing the same periodic oscillations of the
potential as with n-germanium. It is assumed as not being
impossible that the oxide layer at the germanium surface has
semiconductor properties itself, which complicates the pro-
cess investigated here. Summarizing it is stated that an
investigation of the electrochemical reaction of germanium
without taking into account the type of conductivity and the
electric parameters can not furnish a correct picture of the
processes investigated. There are 4 figures, and 5 references.

SUBMITTED: December 3, 1956

1. Germanium—Electrochemistry

Card 2/2

AUTHORS: Yefimov, Ye. A., Yerusalimchik, I. G.   76-32-5-24/47

TITLE: The Effect of the Electrophysical Properties of Germanium on
             the Process of Its Anodic Dissolution (Vliyaniye elektro-
             fizicheskikh svoystv germaniya na protsess yego anodnogo
             rastvoreniya)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol. 32, Nr 5, pp. 1103-1106
             (USSR)

ABSTRACT: Since the kinetics of the process depends on the diffusion of
             the holes to the surface of the semiconductor it is to be ex-
             pected that the magnitude of the specific resistance of
             germanium and the diffusion length also exert an influence
             on the course of the anodic process, so that in the present
             work this is investigated with respect to p- and n-types of
             germanium.   Polarization curves were plotted by means of an
             already described plant and method, in which case it was
             especially clearly observed with the increase of the resistance
             of the n-type of the germanium that an essential decrease of
             polarization takes place, while in the case of the n-type the
             effect is essentially smaller and has a reverse character. In
             the case of higher specific resistances the difference between

Card 1/2

The Effect of the Electrophysical Properties of Germanium   76-32-5-24/47
on the Process of Its Anodic Dissolution

the polarization curves of the two types is small, which is explained by the assumption that the kinetics of the anode dissolution of germanium at current densities of above 3.10^{-3} A/cm^2 is determined by the diffusion velocity of the carriers with positive charge - the holes from the depth of the semiconductor to its surface; this is proved by the data on the influence of the temperature on the shape of the anode polarization curves. From the experimental results on the in-fluence of the diffusion length can be seen that with the above mentioned current densities the same effect was observed as in the case of the specific resistance, but that it is smaller. On the mentioned conditions a decrease of the saturation current of the holes in the crystal will lead to an increase of the polarization with the increase of the diffusion length with equal current densities, which is in agreement with the obtained experimental data. There are 4 figures and 2 references, 2 of which are Soviet.

SUBMITTED: January 29, 1957

Card 2/2
1. Germanium--Electrical properties   2. Germanium--Physical properties   3. Germanium--Electron transitions

AUTHORS: Yemifov, Ye. A., Yerusalimchik, I. G.   SOV/76-32-9-6/46

TITLE: A Study of the Hydrogen Overvoltage on Germanium (Issledovaniye
             perenapryazheniya vodoroda na germanii)

ABSTRACT: The authors investigated the deposition of hydrogen
             on germanium from a 0,1 N solution of HCl at 20°. The
             polarization curves for current densities between 10^{-5}
             and 10^{-1} A/cm^2 were drawn (Figs 1-4). In addition to the
             pure hydrochloric acid solution (polarization curves
             in figure 1) the authors employed hydrochloric acid
             solutions with the following compounds added: sodium
             citrate (polarization curve in figure 2); tetraethyl
             ammonium iodide (polarization curve in figure 3); and
             octyl alcohol (polarization curve in figure 4). The
             authors found that the overvoltage of hydrogen on
             germanium is high, lying between -0,5 and -1,2 V., and
             that at current densities of 10^{-5} to 10^{-3} and 10^{-2} to 10^{-1}
             the overvoltage follows the equations: $\eta = 0,97 + 0,12 \lg I$

Card 1/2

A Study of the Hydrogen Overvoltage on Germanium   SOV/76-32-3-6/46

and $h = 1,33 + 0,12 \lg I$ (I is the current density in amperes per quarter centimeter). The kind of conductivity of the germanium cathode has no influence on the deposition of the hydrogen (Fig 1). All results show that the electro-chemical deposition of hydrogen on germanium takes place according to a mechanism of delayed discharge; this conclusion agrees completely with the theory of A.N.Frumkin (Ref 5). There are 4 figures and 10 references, 8 of which are Soviet.

SUBMITTED: March 27, 1957

Card 2/2

5(4)

AUTHORS: Yefimov, Ye. A.,   Yerusalimchik, I. G.

SOV/2o-122-4-26/57

TITLE: A Germanium Electrode With a p-n-Transition
             (Germaniyevyy elektrod s p-n-perekhodom)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 4, pp 632-634
             (USSR)

ABSTRACT: According to the results of some previous papers (Refs 1, 2),
             the anodic dissolution of germanium depends on the concentra-
             tion of the holes on the surface of the semiconductor. It was
             interesting, therefore, to investigate the behavior of a ger-
             manium electrode with a p-n-transition. By means of such a
             transition, holes could be injected and a region of a reduced
             content of carriers could be formed. The experiments describ-
             ed in this paper were carried out on a plate of germanium
             of the electron conductivity type (specific resistance 20 Ohm.cm,
             diffusion length 1 mm). The initial thickness of the plate
             was 250 μ. The carrying out of the experiments is discussed
             in a few lines. A diagram gives the polarization curves for
             the anodic dissolution of germanium found for the current

Card 1/3   density interval

A Germanium Electrode With a p-n-Transition   SOV/20-122-4-26/57

$10^{-6} - 10^{-2}$ A/cm^2. The second diagram given the variation of the potential of the germanium anode if the positive pole of the current source is connected with an Ohmic ring contact, and if the external circuit of the p-n-transition is disconnected. It is expected that the injection of the holes into the germanium will diminish the polarization of the electrode reaction. In thin germanium plates (for current densities $I > 10^{-3}$ A/cm^2) the anodic dissolution proceeds with a higher polarization than in thick germanium plates. An increase of the return displacement (u_{return}) may extend the region of the space charge to such an extent that it reaches the germanium surface which is in contact with the electrolyte. In order to investigate the behavior of the electrode under such conditions, the authors measured its potential and its capacity for a frequency of 5000 cycles and for various return displacements on the p-n-transition. If u_{return} increases to 15 - 20 V, the capacity of the electrode decreases sharply. However, the potential of the electrode does not vary up to u_{return} = 15 - 20 V, and it grows slowly above this value.

Card 2/3   If the space charge reaches the surface of the germanium plate, the selfdissolution of germanium becomes slower because of a

A Germanium Electrode With a p-n-Transition   SOV/2o-122-4-26/57

> lack of holes, and the potential of the electrode becomes higher. There are 2 figures and 3 references, 1 of which is Soviet.

PRESENTED: May 23, 1958, by A. N. Frumkin, Academician

SUBMITTED: May 21, 1958

Card 3/3

5(4)

AUTHORS: Yefimov, Ye. A., Yerusalimchik, I. G.   SOV/76-33-2-32/45

TITLE: An Investigation of the Capacity of the Germanium Electrode
             (Issledovaniye yemkosti germaniyevogo elektroda)

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 2,
             pp 441 - 446 (USSR)

ABSTRACT: The method of curves of differential capacity makes
             possible a determination of the zero point of the electrode
             metal as well as giving information on the condition of the
             electrode surface. The single paper which reports a
             measurement of the capacity of the germanium electrode is
             that of Bohnenkamp and Engel (Bonenkamp)(Ref 1). In the
             present paper the measurement was carried out according
             to the method described by M. A. Proskurnin and A. N.
             Frumkin (Ref 2). A CSNCh-99I generator, a bridge connection
             constructed on the basis of the universal RIT bridge, and
             a LV-9-2 lamp voltometer were used. The anodic measurements
             took place in a nitrogen atmosphere and the cathodic in a
             hydrogen atmosphere. Before each curve determination the
Card 1/3   electrode was polished and cleaned in SR-4 mordant. According

An Investigation of the Capacity of the Germanium Electrode SOV/76-33-2-32/45

to the equation of R. M. Vasenin (Ref 4) the zero charge
for germanium is 0.34 volt and according to the calculation
data of Ye. A. Ukshe and A. I. Levin (Ref 5) it is
0.63 (-0.47) volt. In the work reported here the measurements
were carried out in 0.1 n hydrochloric acid at frequencies
of 60, 200 and 1000 hertz. The C-ψcurves for germanium of
p-type (Figs 1,2) and for monocrystals of germanium of the
electron type (n-type) show a sharp minimum at 0.6 volt. This
value is close to that of (Ref 5) but much lower than that
calculated from the equation of Vasenin. Curves were plotted
for the differential capacity for germanium of the p and
n-types at current densities of about $10^{-5} - 10^{-1}$ ampere/cm^2
in 0.1 n hydrochloric acid and at frequencies of 200, 1000,
and 5000 hertz (Figs 3-5). These curves showed several differ-
ences in that there was a dependence shown upon the type
(n- or p-) and upon the size of the specific resistance of
the Ge. A polarization at potentials somewhat above 0.5 volt
led to the formation of spots (yellow-brown color) on the
germanium anode, which was attributed to the formation of a
phase oxide of the type GeO. There are 6 figures and 7 refer-
ences, 6 of which are Soviet.

Card 2/3

5(4)

AUTHORS: Yefimov, Ye. A., Yerusalimchik, I. G.   SOV/20-124-3-33/67

TITLE: The Investigation of Electrode Reactions on a Silicon Cathode
                (Issledovaniye elektrodnykh reaktsiy na kremniyevom katode)

ABSTRACT: By employing the method of polarization measurement the authors
                investigated the electronic separation of hydrogen and the
                reduction of potassium ferricyanide on monocrystalline silicon
                of the p- and n-type orientated in the direction 111. These
                investigations were carried out at current densities of from
                10^{-6} to 10^{-1} a/cm^2 at t = 20°. The method of experimental
                investigation has already been described (Ref 6). The ohmic
                contacts with silicon were established by the electrolytic
                application of rhodium. By a previous treatment of silicon in
                boiling KOH (5-10%) the same results were obtained. A hydrogen
                electrode was used in the acid solutions for purposes of
                comparison, and in basic solutions a saturated calomel
                half-element was used for the same purpose. A diagram shows the
Card 1/3   dependence of the overpressure of hydrogen on the logarithm of

The Investigation of Electrode Reactions on a   SOV/20-124-3-33/67
Silicon Cathode

current density in 2n H_2SO_4 on silicon of the p- and n-type
with different specific resistance and with a life of the
unreal current carriers of 30-40 μsec. All curves in the
interval of current densities of 10^{-6} to 10^{-4} a/cm^2 are
practically in agreement and have a coefficient of inclination
of b = 0.18. However, at higher current densities this agreement
ceases. For 1n KOH the curves are of similar character. All
curves shown in the diagrams were determined with the
electrolyzer completely darkened. The course taken by the
curves of hydrogen overpressure for silicon differs considerably
from the analogous curves for germanium. According to the
authors opinion, the difference in the course taken by the
curves of hydrogen on silicon of the p- and n-type in 2n H_2SO_4

is due to the ohmic voltage drop in the impoverished layer of
the semiconductor. For the purpose of confirming this assumption
the authors determined the differential capacity of the silicon
electrode at a frequency of 200 cycles. The greatest ohmic
voltage drop must occur with silicon of the p-type. The decrease

Card 2/3

The Investigation of Electrode Reactions on a
Silicon Cathode   SOV/20-124-3-33/57

of hydrogen overpressure on p-type silicon at 100-200 mv
under the effect of light tends to show that certain
difficulties exist in connection with conveying the supply of
electrons from the interior of the semiconductor to its surface.
This is, however, not the only reason for hydrogen overpressure.
According to the experiments carried out by the authors the
influence of the semiconductor properties of the cathode upon
the kinetics of electrochemical reactions manifests itself in
a different manner in the case of different reactions. The more
electrochemical polarization of the reaction on the cathode
decreases, the more distinctly will the influence exercised
by the semiconductor properties of the electrode material
manifest themselves. There are 4 figures and 6 references,
2 of which are Soviet.

PRESENTED: September 11, 1958, by A. N. Frumkin, Academician

SUBMITTED: September 10, 1958

Card 3/3

5(4)

AUTHORS: Yefimov, Ye. A., Yerusalimchik, I. G.

TITLE: On Particular Features of Electrolytic Oxidation Reactions on a Germanium Anode

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 1, pp 124-126 (USSR)

ABSTRACT: It is an established fact that the kinetics of the anodic dissolution of n-germanium is limited by the diffusion of the holes from the interior of the semiconductor to the surface (Refs 1-5). A similar influence of the semiconductor properties was therefore to be expected also for other anodic reactions. The electrolytic oxidation of bivalent vanadium on a rotating n-germanium anode, however, showed (Ref 6) that the V^{2+}-ions are oxidized without any restriction in that potential range in which the dissolution rate of germanium is limited because of the lack of holes. The question was therefore investigated as to whether in this case a specific behavior of vanadium ions is concerned, or whether this phenomenon occurs also with other oxidations. An investigation was carried out of the oxidation of the oxalate anions and of iodine. Figure 1 shows the dependence of the potential

Card 1/4

SOV/20-128-1-33/58

On Particular Features of Electrolytic Oxidation Reactions on a Germanium Anode

(referred to normal hydrogen electrode) on the current density of an n- and p-germanium anode with a specific resistivity of 1.5 ohm·cm and a diffusion length of 0.4 – 0.5 mm. The introduction of potassium oxalate into the solutions decreases the potential of n-germanium. This phenomenon is particularly marked in the case of high current densities at which, for the anodic dissolution of the n-Ge the limiting current of the diffusion of the holes occurs. By the addition of the oxalate ion this limiting current vanishes. The oxidation of the oxalate, which occurs simultaneously with the dissolution of the Ge, increases the latter within the poten-tial range, in which it is otherwise limited by diffusion of the holes to the surface of the semiconductor. The in-pression is conveyed that the anodic oxidation of

$C_2O_4^{2-}$ increases the concentration of the holes on the surface and thus facilitates dissolution. This is explained by the authors by the fact that the oxidation of the oxalate ion is not due to the holes but to the penetration of electrons

Card 2/4

SOV/20-128-1-33/58

On Particular Features of Electrolytic Oxidation Reactions on a Germanium
Anode

into the Ge-anode. In the case of p-Ge the lowering of the
potential by oxidation of the oxalate ion occurs only at low
current densities. If current densities are higher, an anodic
dissolution of Ge, which is not influenced by the presence
of the $C_2O_4^{2-}$ occurs. In a similar manner the oxidation of
KJ (Fig 2) develops. Here a further process is added, which
accelerates the anodic dissolution of Ge, viz. the reduction
of J on the anode by the capture of electrons from the
valence zone. This reduction could also be visually confirmed
because the discoloring of the solution, which is character-
istic of iodine, did not occur. Iodine in this case probably
plays the part of a current carrier and promotes the exchange
of electrons between the valence zone and the zone of con-
ductivity. Herefrom the authors draw the following conclu-
sions: Only the reaction of the anodic dissolution of Germanium,
which is connected with the destruction of the crystal lattice,
is limited by the diffusion of the holes to the surface.
Other oxidation reactions develop without the assistance of
Card 3/4   the holes, but by the penetration of electrons into the anode.
There are 2 figures and 8 references, 4 of which are Soviet.

YeRUSALIMChIK, I. G.,   Cand Chem Sci — (diss) "Kinetics of electrochemical reactions

on a germanium electrode," Moscow, 1960, 8 pp (Institute of Electrochemistry, AS USSR)

(KL, 35-60, 123)

S/076/60/034/012/017/027
B020/B067

AUTHORS: Yefimov, Ye. A. and Yerusalimchik, I. G., Moscow

TITLE: Hydrogen Evolution on a Germanium Cathode

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 12,
pp. 2804-2807

TEXT: In contrast to the results obtained by W. Brattain and C. Garrett
(Ref. 1) the authors found no difference in the course of the polarization
curves (η-logI) which were taken on p- and n-type germanium at current
densities of 10^{-5} to 10^{-1} a/cm^2 after previous long-lasting polarization
(Ref. 2). The authors attempted to study the reasons of the absence of
a distinct electron diffusion boundary current on the polarization curves.
The curves potential - current were taken by a quick method which permitted
the polarization measurements to be made at a low hydrogen overvoltage. In
the experiments the voltage was applied to the electrolyzer by a special
generator of sawtooth pulses which allowed the voltage supply to be
changed from 30 to 10^{-4} sec. The potential of the germanium electrode
was measured in 0.1 N HCl at current densities of 10^{-3} to 3.10^{-2} a/cm^2

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Hydrogen Evolution on a Germanium Cathode   S/076/60/034/012/017/027
                                                   B020/B067

and 20° as referred to a hydrogen electrode in the same solution (Fig. 1).
Curve 1 corresponds to n-type germanium and curve 2 to p-type germanium.
The curves were taken within three seconds. At a potential more negative
than 0.6 v the curves η - I for n- and p-type germanium cathodes diverge.
At I = 5.10^{-2} a/cm^2 the polarization of the p-type germanium electrode
increases by 0.3 v compared to that of n-type germanium. When measuring
the potential after preceding cathodic polarization of the electrode to
a constant potential no deviation was found between the curves of p-type
and n-type germanium. The difference in the kinetics of the electrolytic
evolution of hydrogen on p- and n-type germanium becomes manifest only at
current densities exceeding 3.10^{-3} a/cm^2 and in a very short initial
range. This phenomenon is connected with the bending of the energy zones
on the semiconductor surface during adsorption and the entrance of the
hydrogen atoms into the crystal lattice. Fig. 2 shows the φ - I curves for
a solution of 0.1 N HCl + 0.1 N (NH$_4$)$_2$S$_2$O$_8$ which were taken within three

seconds on n-(curve 1) and p-(curve 2) type germanium, whereas curve 3
corresponds to the hydrogen evolution in 0.1 N HCl on n-type germanium.
At current densities exceeding 10^{-1} a/cm^2 the potential of the p- and

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Hydrogen Evolution on a Germanium Cathode   S/076/60/034/012/017/027
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n-type germanium electrode rose strongly and anomalously (Fig. 3). This
was not the case in degenerate semiconductors because of their ohmic fall
of potential in the impoverished layer on the germanium surface and in
the semiconductor mass. The electron diffusion from the mass of p-type
germanium to its surface reduces the rate of electrochemical reaction
neither in hydrogen evolution nor in the reduction of the persulfate ion.
There are 3 figures and 8 references: 3 Soviet, 3 US, and 2 British.

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8/076/61/035/002/011/015
B107/B220

AUTHORS: Yefimov, Ye. A. and Yerusalimchik, I. G. (Moscow)

TITLE: Anodic dissolution of silicon in hydrofluoric acid

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 2, 1961, 384-388

TEXT: The process of anodic dissolution of p-type and n-type silicon with
specific resistance of about 10Ω cm in 2.5 N hydrofluoric acid at $20^{\circ}C$ has
been studied. The investigation is of practical interest for the electro-
chemical etching of silicon. The silicon samples tested were toward (111);
the minority carriers have an average lifetime of 30-40 μsec. Polarization
and differential capacity were measured referred to a saturated calomel
electrode; the potential-versus-time curves were measured with an ЭНО-1
(ENO-1) oscilloscope. The method has been described by the authors in a pre-
vious paper on the dissolution of germanium (Zh. fiz. khimii, 33, 441, 1959).
Fig. 1 shows the potential for anodic dissolution at current densities bet-
ween 10^{-6} and 10^{-2} A/cm². n-type silicon shows a clearly marked limiting
current which is still increased by adding potassium ferricyanide to the

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Anodic dissolution of ...

solution. For p-type silicon, however, φ is a linear function of log I between 10^{-6} and $5 \cdot 10^{-3}$. It follows therefrom that the dissolving process is determined by the number of holes at the silicon-electrolyte interface. The dissolution causes the formation of an oxide layer which is dark on p-type silicon and dissolves hardly in concentrated hydrofluoric acid, but with vigorous evolution of hydrogen in cold potassium hydroxide. The oxide layer on n-type silicon is much thinner and reacts hardly with potassium hydroxide, but is dissolved in concentrated hydrofluoric acid. Apparently, the oxide layer on p-type silicon consists mainly of bivalent, and that on n-type silicon of tetravalent silicon compounds. Differential capacity was measured at 200, 1000, and 10,000 cps. (Figs. 2 and 3); the curves correspond to those for germanium, but the capacity is lower. For p-type silicon it is about one order of magnitude higher than for n-type silicon; this is due to the fact that in the latter the impoverished carrier band is broader. The change of the electrode potential after reversing from cathode to anode direction is shown in Fig. 4. Conclusions: The first stage of anodic dissolution is the electrochemical oxidation of the electrode surface; then, the hydrofluosilicic compounds formed on the surface enter the solution; this process

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Anodic dissolution of S/076/61/035/002/011/015
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is, however, limited by the number of holes at the semiconductor-electrolyte
interface. If there is an insufficient number of holes (as in the case of
n-type silicon), the dissolution of the silicon oxide compounds formed on the
surface is rendered difficult and electrochemical oxidation of the electrode
surface continues unimpeded. Probably, this is the reason why tetravalent
and bivalent silicon compounds are formed on n-type and p-type silicon,
respectively. There are 4 figures and 5 references: 1 Soviet-bloc and
4 non-Soviet-bloc. The references to the three English-language publications
read as follows: Uhlir, Bell System Techn. J., 35, 333, 1956; Turner,
J. Electrochem. Soc., 105, 402, 1958, Flynn, J. Electrochem. Soc., 105, 715,
1958.
SUBMITTED: June 10, 1959

Legend to Fig. 1: Anode polarization in the dissolution of silicon:
(1) n-type silicon in 2.5 N HF; (2) p-type silicon in 2.5 N HF; (3) n-type
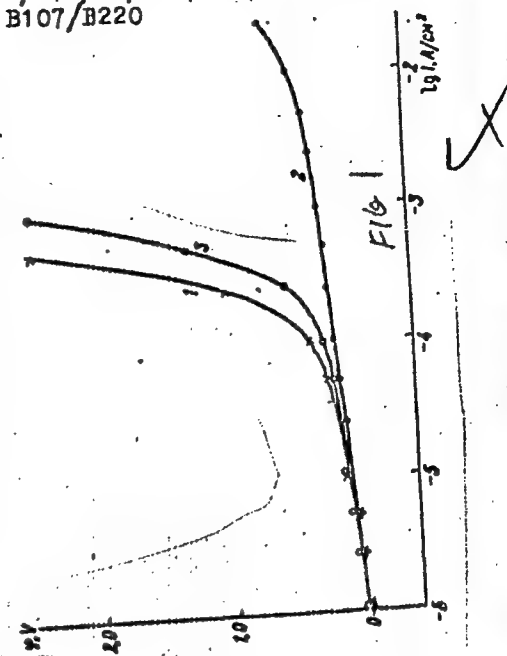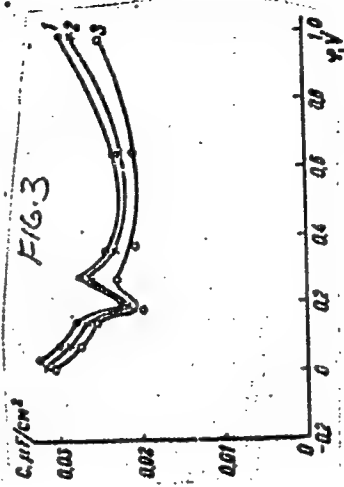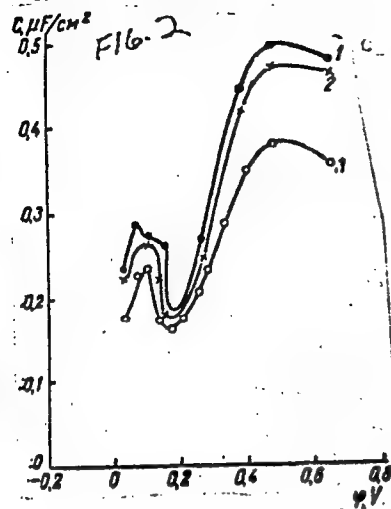silicon in 2.5 N HF + 0.05 N $K_3Fe(CN)_6$.
Legend to Fig. 2: Differential capacity for p-type silicon: (1) 200 cps;
(2) 1000 cps; (3) 10 000 cps.
Legend to Fig. 3: Differential capacity for n-type silicon: (1) 200 cps;
                            (2) 1000; (3) 10,000 cps.
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B107/B220

Anodic dissolution of ...
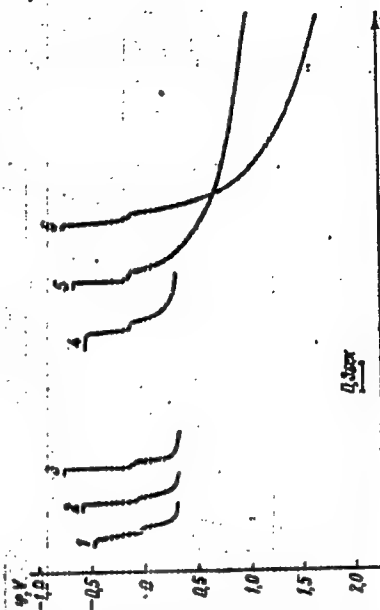
FIG. 2

FIG. 3

FIG. 1

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Legend to Fig. 4: Electrode potentials for the
reversal of current direction: (1) p-type
silicon, $I = 10^{-4}$ A/cm^2; (2) p-type silicon,
$I = 2 \cdot 10^{-4}$ A/cm^2; (3) p-type silicon,
$I = 5 \cdot 10^{-4}$ A/cm^2; (4) n-type silicon,
$I = 10^{-4}$ A/cm^2; (5) n-type silicon,
$I = 2 \cdot 10^{-4}$ A/cm^2; (6) n-type silicon,
$I = 5 \cdot 10^{-4}$ A/cm^2.

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5(4)

SOT/20-130-2-31/69

AUTHORS: Yefimov, Ye. A., Yerusalimchik, I. G,

TITLE: On the Particular Features of the Electrochemical Dissolu-
              tion of n-Type Silicon

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 130, Nr 2,
              pp 353 - 355 (USSR)

ABSTRACT: This paper is an experimental confirmation of the assump-
              tion made by J. Flynn (Ref 4), according to which, un-
              like what is the case with germanium, mainly the holes
              are used up in the electrochemical dissolution of Si which
              are formed in the space charge layer on the boundary between
              semiconductor and electrolyte, and where only an insigni-
              ficant number of holes is formed by generation within the
              semiconductor. The method employed is described in refer-
              ence 3. The experiments were made by means of an n-silicon
              lamella (resistivity about 3 ohm.cm). On one side of the
              lamella a p-n junction with an area of 0.03 cm^2 was pro-
              duced by melting aluminum, and on the same side an ohmic
              contact was connected. The lamella was insulated by means

Card 1/3   of silicon-varnish and paraffin with the exception of the

On the Particular Features of the Electrochemical   SOV/20-130-2-51/69
Dissolution of n-Type Silicon

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place opposite the p-n junction. The thickness of the
n-Si layer between the boundary of the p-region and the
electrolyte was 20-25μ. The experiments were made at
20° in 2.5n HF. Figure 1 shows the polarization curves of
the anodic dissolution of Si in the interval of current
densities from 10^{-6} to $5 \cdot 10^{-4}$ a/cm^2. Curve 1 was obtained
with an open circuit of the p-n junction and connection
of the positive pole of the current source to the ohmic
contact. Curve 2 was obtained by connection of a back bias
of 100 v to the p-n junction. Both curves are in full
agreement. For comparison, curves are introduced, which
were obtained with ordinary Si-electrodes with a specific
resistance of 3 ohm.cm and 10 ohm.cm. The change in elec-
trode thickness in the case of the same specific resistance
exerts no influence on the anodic dissolution of Si, which
is in contradiction to the results obtained with germanium
(Ref 3). Thus it has been proven that the holes necessary
for the anodic dissolution of Si are essentially formed

Card 2/3   within the region of the space charge on the boundary

(6757)

On the Particular Features of the Electrochemical SOV/20-130-2-31/69
Dissolution of n-Type Silicon

between semiconductor and electrolyte, but not within
the semiconductor. A further confirmation of this opinion
was provided by the experiments made with reduced
$(C_2O_4^{2-})$ and oxidizing $(K_3Fe(CN)_6)$-additions to the elec-
trolyte (Refs 6,7). There are 1 figure and 7 references,
3 of which are Soviet.

PRESENTED: September 8, 1959, by A. N. Frumkin, Academician

SUBMITTED: September 8, 1959

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S/020/60/134/006/023/031
B004/B054

AUTHORS: Yefimov, Ye. A. and Yerusalimchik, I. G.

TITLE: Investigation of the Surface State of Anodically Polarized
               Germanium in Alkaline Solutions

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 6,
               pp. 1387-1389

TEXT: The authors studied the state of anodically polarized germanium
by recording the curve of charge. To exclude semiconductor effects, they
used degenerate polycrystalline germanium. The experiments were made in
0.1 N KOH at 20°C. The germanium electrode was anodically polarized at
various current densities for a certain period. Then, the curve of charge
was recorded at a current density of 10^{-5} a/cm² by means of an ЭНО-1
(ENO-1) oscilloscope. Fig.1 shows the curves of charge after anodic polari-
zation at the potentials -0.350 v and -0.330 v, and a duration of 10, 20,
60, and 120 sec. In all cases, the authors observed, at about -0.75 v,
a retardation of the potential increase which is due to the oxygen dis-
charge on the germanium surface. In anodic polarization $\varphi = -0.35$ v,
the amount of electricity needed is about $4.5 \cdot 10^{-4}$ coulomb/cm², and does

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Investigation of the Surface State of   S/020/60/134/006/023/031
Anodically Polarized Germanium in Alkaline   B004/B054
Solutions

not depend on the time of polarization. The potential of about 1.4 v cor-
responds to the potential of hydrogen separation on a pure germanium sur-
face in 0.1 N KOH at $I = 10^{-3}$ a/cm^2. The amount of chemically adsorbed
oxygen depends on the potential of anodic polarization. It is completely
eliminated by cathodic polarization at $\varphi < -0.35$ v. With an increase in
the potential to -0.330 v, a horizontal step appears in the curve of charge
at $\psi \approx -0.75$ v. The total amount of electricity needed to remove the oxygen
rises by one order of magnitude, and now depends on the duration of the
preceding anodic polarization (10^{-3} coulomb/cm^2 at $\tau = 10$ sec,

$7 \cdot 10^{-3}$ coulomb/cm^2 at $\tau = 120$ sec). The observed step makes the authors
conclude that with anode potentials higher than -0.35 v, part of the elec-
trochemically adsorbed oxygen is bound more closely to the surface. A
monomolecular GeO layer is formed. Fig. 2 shows that the retardation at
$\varphi = -0.75$ v can only be observed at anodic potentials below $\psi = -0.180$ v.
At higher potentials or after longer polarization, the horizontal step
disappears. Fig. 3 shows the curve of charge at anodic polarization with
$I = 2.5 \cdot 10^{-2}$ a/cm^2 ($\varphi = -0.03$ v). After longer duration of polarization,
the potential of the electrode rises to +0.6 v due to slow diffusion

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Investigation of the Surface State of
Anodically Polarized Germanium in Alkaline   S/020/60/134/006/023/031
Solutions   B004/B054

of OH$^-$ ions to the electrode surface, and a new retardation appears on
the curve of charge at ψ = -0.25 v. The experimental data show that the
total amount of O adsorbed to Ge may attain more than 10 monomolecular
layers. In the case of anodic dissolution, an oxide layer forms which is
cathodically reduced at ψ = -0.75 . There are 3 figures and 3 non-Soviet
references.

PRESENTED: June 8, 1960, by A. N. Frumkin, Academician

SUBMITTED: June 8, 1960

Card 3/3

YEFIMOV, Ye.A.; YERUSALIMCHIK, I.G. (Moscow)

Anodic dissolution of silicon in hydrofluoric acid. Zhur. fiz. khim. 35 no.2:384-388 F '61.   (MIRA 16:7)

(Silicon)   (Hydrofluoric acid)
(Electrochemistry)

5 4600 1043, 1145, 1273

S/076/61/035/003/006/023
B121/B203

AUTHORS: Yefimov, Ye. A. and Yerusalimchik, I. G.

TITLE: Anodic dissolution of germanium in the presence of reducing
             agents

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 3, 1961, 543-547

TEXT: The authors studied the mechanism of anodic dissolution of thin
germanium electrodes on addition of reducing agents such as $C_2O_4^{2-}$ or I^-. The
electrode used was a germanium lamina with a resistivity of 20 Ωcm and a
diffusion length of 1 mm. The germanium lamina was 200 μ thick. On one
side of the germanium lamina, a p-n electron transition was produced by al-
loying with indium. The potential of this germanium electrode with respect
to a saturated calomel electrode was determined for various current densi-
ties at 20°C. All polarization curves obtained in the presence of reducing
agents showed a distinct limiting current with potentials more positive than
0.5 v. The authors discussed the mechanism of accelerated germanium dissolu-
tion on addition of a reducing agent. Experimental data showed an additional
supply of holes from the lower semiconductor layers to its surface in the
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Anodic dissolution ...

presence of reducing agents. Electrons are injected in germanium during the oxidation of reducing agents. This produces an electric field permitting the supply of holes from the interior of the semiconductor to the surface. This accelerates anodic dissolution. The increase in the saturation current is higher on addition of I^- ions than of $C_2O_4^{2-}$ ions to the solution.

This circumstance is due to partial reversibility of the reduction of molecular iodine according to Gerisher and Beck's mechanism (Ref. 3: J. Phys. Chem. (N. F.), 13, 389, 1957). There are 3 figures and 4 references: 2 Soviet-bloc and 2 non-Soviet-bloc. The two references to English-language publications read as follows: Gerisher, Beck, J. Phys. Chem. (N. F.), 13, 389, 1957; Shockley, Bell, System Tech. J., 28, 435, 1949.

SUBMITTED: June 19, 1959

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S/076/62/036/001/008'017
B 10 7 /B110

AUTHORS: Yefimov, Ye. A., and Yerusalimchik, I. G. (Moscow)

TITLE: Study of the surface condition of anodically polarized
germanium in acid solutions

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 1, 1962, 98 - 102

TEXT: The surface condition of a germanium anode has been studied at a
current density of 10^{-5} to 10^{-1} a/cm^2 in 0.1 N H_2SO_4 at 20°C. All the
experiments were made with polycrystalline, non-semiconductive, degenerate
germanium with an impurity concentration of nearly 0.01%. Preliminary
tests have shown that germanium of this type behaves in anodic dissolution
like p-type germanium. The charge curves were measured with an ЭНО-1
(ENO-1) oscilloscope. The germanium electrode was anodically polarized
at different current densities for some time, whereupon the φ -Q curve was
recorded at a cathode current density of 10^{-3} a/cm^2. The germanium
electrode was etched in CP-4 (SR-4) before each experiment. In addition,

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Study of the surface condition...

S/076/62/036/001/008/017
B107/B110

its resistance and capacitance were determined between 60 and 5000 cps. It has been found that an electrochemically adsorbed layer of oxygen is formed on the germanium surface at a potential less than 0.38 v. The layer has a thickness of about 2 - 13 oxygen atoms, which is independent of the potential and of the time of polarization. A monomolecular layer of a defined compound of one germanium atom per oxygen atom starts forming above 0.38 v. This monomolecular layer exhibits a high resistance and can be entirely dissolved cathodically. At 0.57 v and more, thick, macroscopically detectable layers of GeO, the thickness of which grows with the potential and with the duration of polarization, are formed on the germanium surface. The oxide is not completely dissolved by cathodic polarization. The potential required for the separation of oxygen on it is higher than on pure germanium. There are 5 figures and 5 references: 1 Soviet and 4 non-Soviet. The two references to English-language publications read as follows: D. Turner, J. Electrochem. Soc., 103, 252, 1956; J. Law, P. Meigs, Semiconductor Surface Physics, N. Y., 1957, p. 383.

SUBMITTED: April 6, 1960

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Oxidation of germanium surface ...   S/076/62/036/004/005/012
                                                      B101/B110

of the Ge electrode after etching for 15 sec were measured, and also the
quantity of electricity (coulomb/cm^2) required for removal of the oxygen
bound to the Ge surface after etching the sample for 5, 10, 15, 30 or
60 sec. Results: (a) on the germanium surface, each of the etching agents
formed oxide films of a structure and composition specific to the etching
agent; (b) the most homogeneous film is formed by the H_2O_2 etching agent

no. 4; the charging curve of Ge treated with this etching agent shows a
clearly horizontal course for $\psi = -0.3$ v; (c) with the exception of the
etching agent no. 4, the specific effect of all etching agents is lost
after 1-4 hrs exposure to air. The quantity of electricity necessary for
reducing the oxide film was $4.3 \cdot 10^{-3}$ after 1 hr exposure to air; $5.0 \cdot 10^{-3}$
after 2 hrs; and $5.8 \cdot 10^{-3}$ coulomb/cm^2 after 4 hrs, from which the formation
of GeO_2, which is reduced at $\psi \approx -0.2$ v, may be inferred, this being in
good agreement with R. J. Archer (J. Electrochem. Soc., 104, 619, 1957).
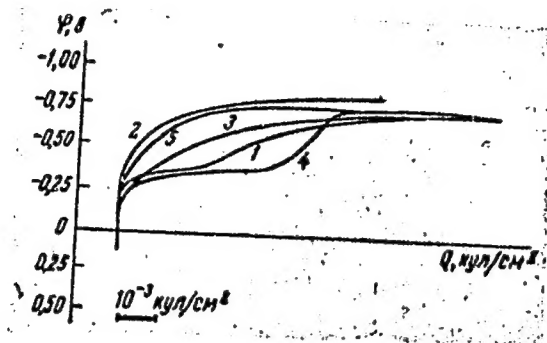There are 4 figures and 1 table.

SUBMITTED: : June 30, 1960

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Oxidation of germanium surface ...

S/076/62/036/004/005/012
B101/B110

Fig. 1: Charging curves of Ge after 15 sec etching. (1), (2), (3), (4) and (5) etching agents seen in the body of the abstract.

Legend: ordinate φ, v; abscissa Q, coulomb/cm^2.

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